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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,756	03/28/2005	Roland Kozlowski	33694-508001US	6585
35437 7590 05/21/2009 MINTZ LEVIN COHN FERRIS GLOVSKY & POPEO ONE FINANCIAL CENTER BOSTON, MA 02111				
EXAMINER				
GROSS, CHRISTOPHER M				
ART UNIT		PAPER NUMBER		
1639				
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05/21/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/506,756

**Applicant(s)**

KOZLOWSKI ET AL.

**Examiner**

CHRISTOPHER M. GROSS

**Art Unit**

1639

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 8-27 is/are pending in the application.
- 4a) Of the above claim(s) 8-15 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-19 and 21-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

### DETAILED ACTION

Responsive to communications entered 2/27/2008;10/2/2008;2/9/2009. Claims 8-27 are pending. Claims 8-15, 20 are withdrawn. Claims 16-19,21-27 are under consideration.

#### ***Elections/Restrictions***

Applicant's election of a tetrameric Kv (voltage-gated) potassium channel beta subunit tagged with biotin for the species of cytosolic accessory protein in the reply filed on 2/9/2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

During a telephone conversation with Ilona Gont on 5/18/2009, it was agreed that active claims 16-19,21-27 read on said elected species of cytosolic accessory protein.

Claim 20 is hereby withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 2/9/2008.

***Priority***

The present application 10/506,756 is the national stage of PCT/GB03/01049, filed 3/13/2003, under 35 U.S.C. 371. This application claims foreign priority to United Kingdom priority document 0205910.3, filed 3/13/2002.

***Specification***

**Nucleotide and/or Amino Acid Sequence Disclosure**

The disclosure is objected to because of the following informalities: While it is acknowledged that applicant added sequence identifiers to the specification on 2/27/2008, this application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825 for the following reason(s): The text of the specification discloses nucleotide or amino acid sequences but the application does not contain, as a separate part of the disclosure, a paper copy of the "Sequence Listing" or a statement that the paper copy and the computer readable form are the same and does not contain "new matter," as required by 37 C.F.R. 1.821(c and g). See notice to comply.

Applicant is required to comply with the corrections to the sequence listing as part of a complete response to this official action.

***Withdrawn Objection(s) and/or Rejection(s)***

The rejection of claims 1-7 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention

The rejection of claims 1-7 under 35 U.S.C. 102(e) as being anticipated by Kornbluth et al., US 20020188104 A1, (of record), and as evidenced by Shisheva, Methods In Enzymology, (2001), Vol. 329, 39-50, (of record); Leung et al., J. Biol. Chem. (Jan. 31, 1997), Vol. 272 (5), 2607-2614, (of record); or Zarsky et al., FEBS Letters (1997) vol. 403, 303-308), (of record) is hereby withdrawn in view of applicant's cancellation of the claims.

The rejection of claims 1-7 under 35 U.S.C. 102(e) as being anticipated by Charych et al, US 20020055125 A1, (of record), and as evidenced by Shisheva, Methods In Enzymology, (2001), Vol. 329, 39-50, (of record); Leung et al., J. Biol. Chem. (Jan. 31, 1997), Vol. 272 (5), 2607-2614, (of record); or Zarsky et al., FEBS Letters (1997) vol. 403, 303-308), (of record) is hereby withdrawn in view of applicant's cancellation of the claims.

The rejection of claims 1-7 under 35 U.S.C. 102(b) as being anticipated by Patron et al., US 20010041349 A1, (of record), and as evidenced by Shisheva, Methods In Enzymology, (2001), Vol. 329, 39-50, (of record); Leung et al., J. Biol. Chem. (Jan. 31, 1997), Vol. 272 (5), 2607-2614, (of record); or Zarsky et al., FEBS Letters (1997) vol. 403, 303-308), (of record) is hereby withdrawn in view of applicant's cancellation of the claims.

The rejection of claims 1-7 under 35 U.S.C. 102(b) as being anticipated by Wagner et al., WO 0004382 A1, and as evidenced by Shisheva, Methods In Enzymology, (2001), Vol. 329, 39-50, (of record); Leung et al., J. Biol. Chem. (Jan. 31, 1997), Vol. 272 (5), 2607-2614, (of record); or Zarsky et al., FEBS Letters (1997) vol. 403, 303-308, (of record) is hereby withdrawn in view of applicant's cancellation of the claims.

***New Claim Rejection(s) - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 16-19,21,27 are rejected under 35 U.S.C. 102(b) as being anticipated by **Wang et al** (1996 JBC 271:23811-23817 – IDS entry 2/22/2006; added to the present 892 to correct the incorrect volume no. in the IDS) as evidenced by Gulbis et al (1999 Cell 97:943-952).

*This rejection is necessitated by applicant's amendments to the claims.*

The claimed subject matter per claim 16 is drawn to an array comprising:

a surface having attached thereto at least one cytosolic accessory protein of a membrane protein selected from ion channels, G protein coupled receptors and transmembrane transporter proteins, wherein said cytosolic accessory protein is free

from membrane protein components or other subunits of said ion channel, G protein coupled receptor or transmembrane transporter protein complex.

Claims 17-19,21,27 represent variations thereof.

**Wang et al** teach, throughout the document and especially figure 3 (with additional data disclosed in table I), an array of voltage-gated potassium channel beta 1.3 subunits analyzed with a yeast two hybrid system which shows some beta 1.3 subunits interact with alpha subunits and others do not. Said voltage-gated potassium channel beta 1.3 subunits which do not interact with said alpha subunit provide a surface having attached thereto at least one cytosolic accessory protein of a membrane protein selected from ion channels wherein said cytosolic accessory protein is free from membrane protein components or other subunits of said ion channel, as set forth in claim 16.

Said voltage-gated potassium channel beta subunits of Wang et al read on the Kv channel beta 1.3 subunits (elected species) set forth in claims 17,18 & 19 and is an ion channel subunit domain, reading on claim 21.

Evidence provided by Gulbis et al in figure 1 indicates that said Kv channel beta subunits of Wang et al are inherently tetrameric (elected species), reading on claim 27.

### ***New Claim Rejection(s) – 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 16-19, 21-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Wang et al** (1996 JBC 271:23811-23817 – IDS entry 2/22/2006; added to the present 892 to correct the incorrect volume no. in the IDS) as evidenced by Gulbis et al (1999 Cell 97:943-952) in view of **Charych et al II** (US Patent 7148058) .

*This rejection is necessitated by Applicant's amendment to the claims.*

**Wang et al** is relied on as above.

Said Kv channel beta 1.3 subunits of Wang et al read on the ion channel of claim 23 (in part).

Wang et al do not teach biotin tagging or immobilization via a common marker, as set forth in claims 22-26.

**Charych et al II** teach, throughout the document and especially the title preparation of protein microarrays on mirrored substrates.



Charych et al II teach in column 6, biotinylated proteins (elected species) may be immobilized thereto said microarray, therein reading on the affinity tagged protein of claims 22,23,24,25 and/or the common marker of claim 26.

It would have been *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made to analyze the Kv channel beta 1.3 subunits of Wang et al by anchoring to the protein microarrays on mirrored substrates in the manner of Charych et al II.

One of ordinary skill in the art would have been motivated to analyze the Kv channel beta 1.3 subunits of Wang et al by anchoring to the protein microarrays on mirrored substrates in the manner of Charych et al II because the mirrored substrates provide 20-50 x signal amplification, as noted by Charych et al II in column 10 line 50.

One of ordinary skill in the art would have had a reasonable expectation of success in applying the mirrored substrates of Charych et al toward studying the Kv channel subunits of Wang et al because Charych et al state the array is well suited toward studying protein-protein interactions (e.g. the Kv channel alpha subunits of Wang et al) in the abstract.

In conclusion, the claimed invention was within the ordinary skill in the art to make and use at the time the claimed invention was made and was as a whole, *prima facie* obvious.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER M. GROSS whose telephone number is (571)272-4446. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on 571 272 0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Christopher M Gross  
Examiner  
Art Unit 1639

cg

/ Christopher S. F. Low /  
Supervisory Patent Examiner, Art Unit 1639